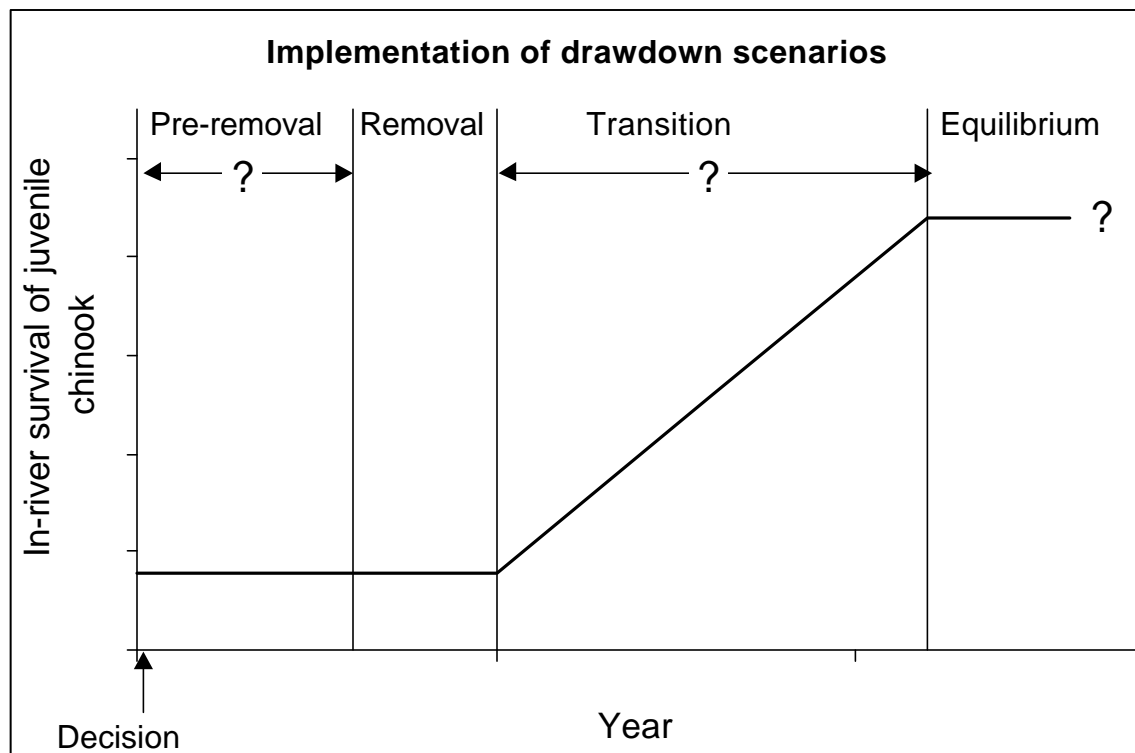


## Q5. Survival of juvenile and adult salmon under free-flowing conditions (drawdown assumptions)

### Uncertainties / Issues:

- Timing of dam removal, changes in river condition
- Survival rates through various phases in removal



## **Implementation:**

### Length of pre-removal period

H1: 3 years } - Congressional approval, litigation  
H2: 8 years } - assumed decision made in 1999

### Length of transition period

H1: 2 years - physical changes (e.g. channel stability)

H2: 10 years - biological changes (e.g. predators)

- assumed linear increase in survival to equilibrium levels; but assuming initial 50% decrease in in-river survival had little effect on results<sup>1</sup>

### Equilibrium juvenile survival through drawdown reach

H1: survival same as current free-flow (0.85)

- based on 1993-1996 survival in free-flowing Snake R. reach (Whitebird/Imnaha trap to LGR)

H2: survival returns to pre-dam condition (0.96)

- based on 1966-1968 survival in free-flowing Snake R. reach (Whitebird trap to IHR)

### Equilibrium adult survival through drawdown reach

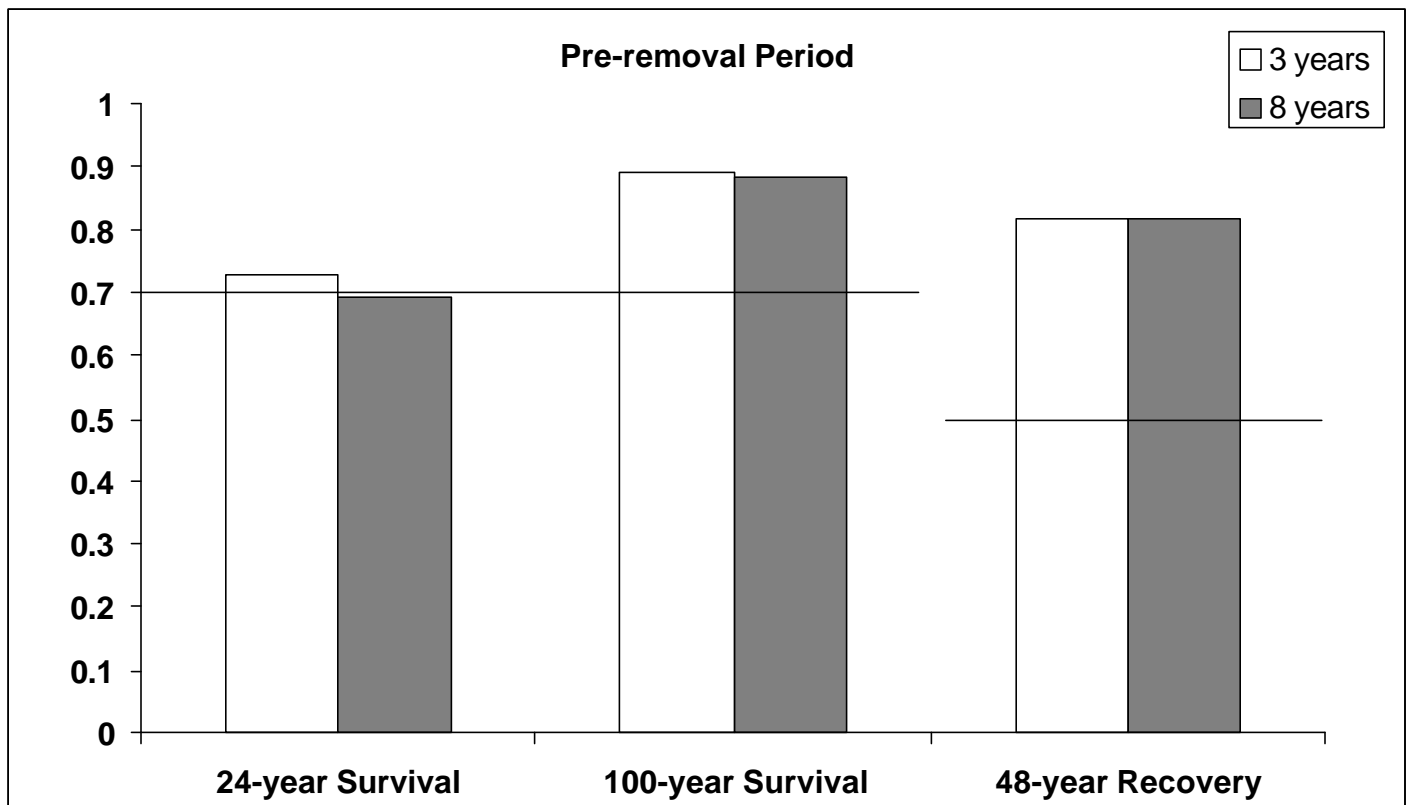
- assumed 97%, based on 1975-1995 average (85%) + average change in survival to spawning grounds following completion of IHR (12%)

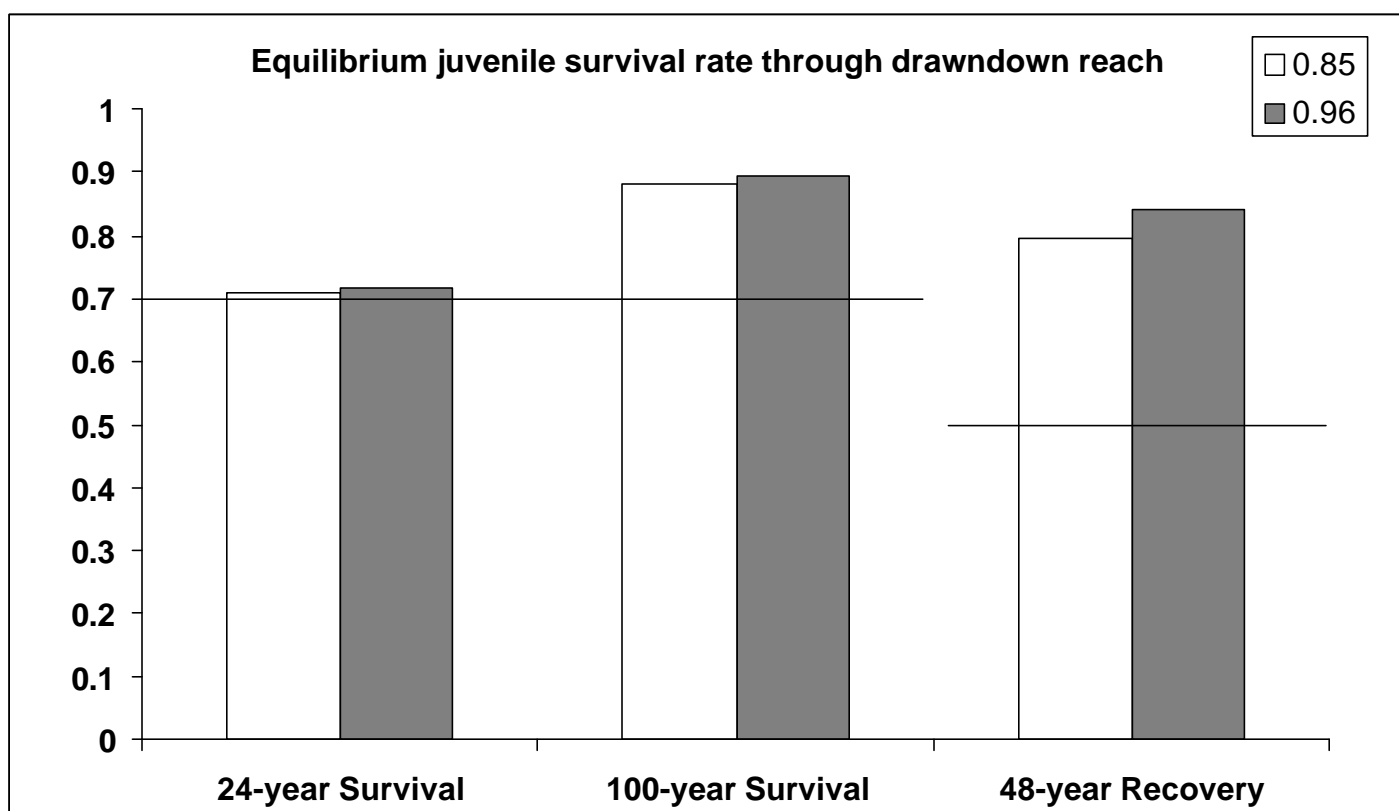
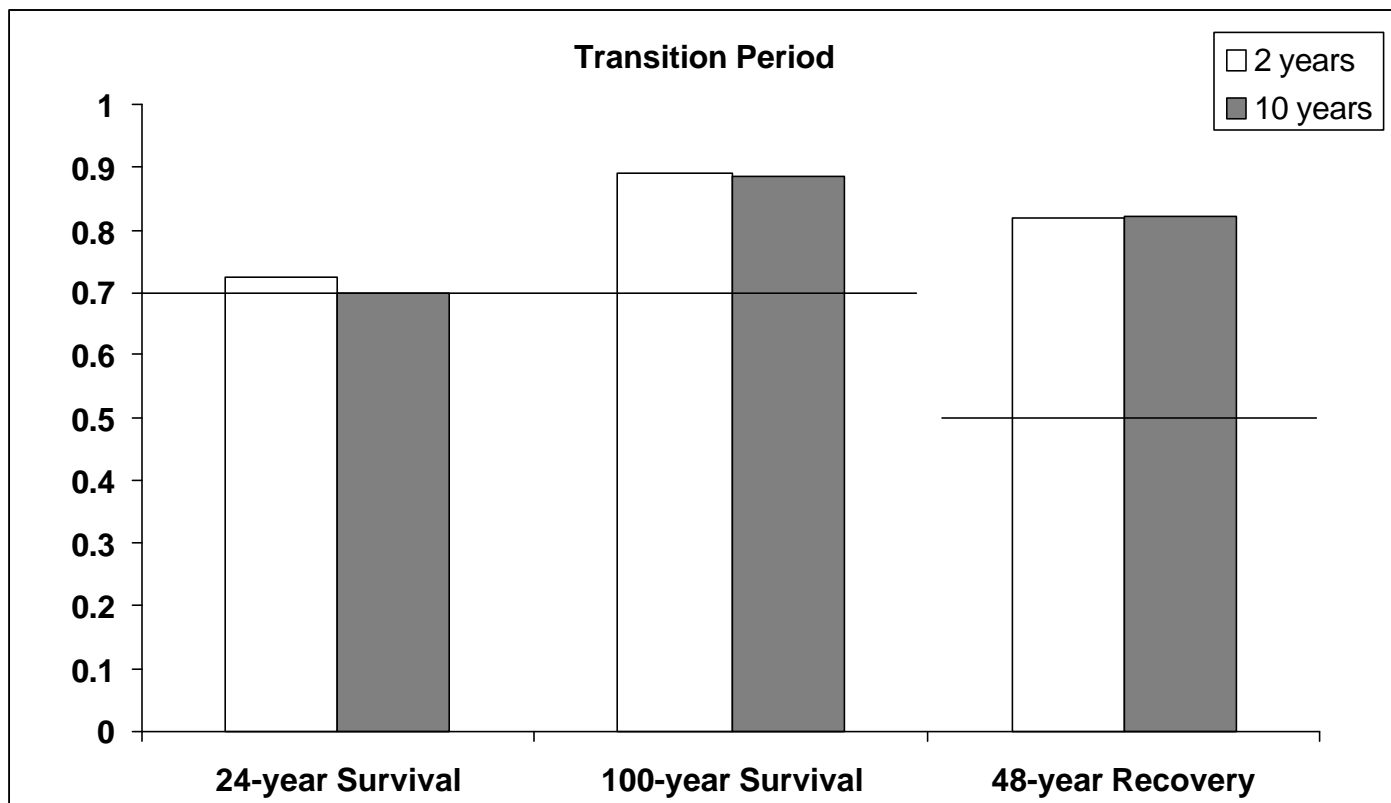
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<sup>1</sup> WOE Fig. 5-2, 5-3

## Implications

- Drawdown assumptions have minor effects on jeopardy probabilities, although timing assumptions can affect 24-year standard
- Further sensitivity analyses of transition period survival, adult survival proposed for FY99





## Evidence

### Length of pre-removal period

- No evidence - not a scientific uncertainty
- Depends on how decision-making and approval process develop (policy choice)

### Length of transition period

- Preliminary Estimates of River Response Times to Drawdown (Battelle – PNNL)<sup>2</sup>

| Attribute                                  | Timeframe for Initial Response |
|--|--------------------------------|
| Natural variability in flows / H2O quality | 2+                             |
| Balanced fine/coarse sediments             | 5-10+                          |
| Mobilized channelbed surface               | 2+                             |
| Complex channel morphology                 | 1-50+                          |
| Periodic channelbed scour / fill           | 5+                             |
| Functional floodplain                      | 3-5+                           |
| Diverse riparian plant communities         | 3-20+                          |

### Equilibrium juvenile survival through drawdown reach

- Virtually no evidence on future effects of Snake R. drawdown
- evidence from other dam removals has limited applicability

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<sup>2</sup> WOE Submission 13